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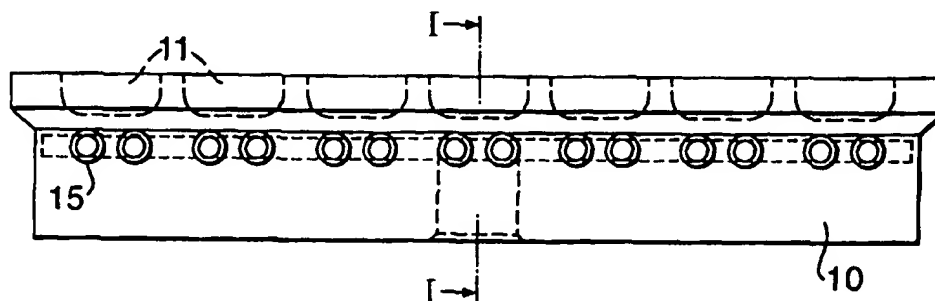
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- (71) Applicant (for all designated States except US):  
**RECKITT BENCKISER (UK) LIMITED** [GB/GB];  
103-105 Bath Road, Slough, Berkshire SL1 3UH (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **HAMMOND, Geoffrey, Robert** [GB/GB]; 574 James Reckitt Avenue, Hull HU8 0LG (GB). **ROGERS, Richard** [GB/GB]; Meadows View, Harling Road, Great Hockham, Thetford, Norfolk IP24 1NT (GB).
- (74) Agents: **DICKSON, Elizabeth, Anne** et al.; Reckitt Benckiser plc, Group Patents Department, Dansom Lane, Hull HU8 7DS (GB).
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: PROCESS AND MOULD FOR THERMOFORMING CONTAINERS



(57) Abstract: The present invention relates to a method of manufacturing water-soluble containers using a horizontal intermittent motion thermoforming machine which comprises the steps of: a) locating a first water-soluble film over a mould, said mould containing a plurality of pocket forming cavities, defined by side walls and a base, in a 2-dimensional array, each cavity being surrounded by a planar surface of the mould on all sides in which the shortest dimension of the planar surface between two adjacent cavities is at least 3 mm and between an edge of the mould and the closest cavity is at least 1.5 mm; b) thermoforming the first film to produce a plurality of pockets; c) at least partially filling the pockets with a composition; and d) sealing the plurality of the at least partially filled pockets. The cavities are positioned in the array such that there are a plurality of continuous strips of uninterrupted planar surface of the mould from a leading to a trailing edge of the mould, for receiving support means fitted to the machine for supporting the film.

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CLAIMS

1. A process for producing a water-soluble container  
using a horizontal intermittent motion thermoforming  
5 machine which comprises the steps of:
- a) locating a first water-soluble film over a mould,  
said mould containing a plurality of pocket forming  
cavities, defined by side walls and a base, in a 2-  
10 dimensional array, each cavity being surrounded by a  
planar surface of the mould on all sides in which  
the shortest dimension of the planar surface  
between two adjacent cavities is at least 3mm and  
between an edge of the mould and the closest cavity  
15 is at least 1.5mm;
  - b) thermoforming the first film to produce a  
plurality of pockets;
  - 20 c) at least partially filling the pockets with a  
composition; and
  - d) sealing the plurality of the at least partially  
filled pockets,
  - 25 wherein the cavities are positioned in the array  
such that there are a plurality of continuous strips of  
uninterrupted planar surface of the mould from a leading  
to a trailing edge of the mould, for receiving support  
30 means fitted to the machine for supporting the film.
2. A process as claimed in claim 1 in which step d)  
comprises placing a second water-soluble film on top of  
the at least partially filled pockets and sealing the  
35 films together.
3. A process as claimed in any one of the preceding  
claims in which the water-soluble film is a poly (vinyl

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4. A process as claimed in any one of the preceding claims in which the depth of the cavities lies in the range of 10 to 80% of the shortest dimension of the mouth cavity.
- 5
5. A process as claimed in any one of the preceding claims in which the depth of the cavities lies in the range of 40 to 60% of the shortest dimension of the mouth cavity.
- 10
6. A process as claimed in any one of the preceding claims in which the cavity bases are planar.
- 15
7. A process as claimed in any one of claims 1 to 4 in which the cavity bases are rounded.
8. A process as claimed in claim 6 in which the rounded bases have a radius of 20mm.
- 20
9. A process as claimed in any one of the preceding claims in which corners formed where the cavity side walls meet each other are rounded.
- 25
10. A process as claimed in claim 9 in which the side wall corners have a radius of 10mm.
11. A process as claimed in any one of the preceding claims in which edges formed where the cavity side walls meet an upper surface of the mould are rounded.
- 30
12. A process as claimed in claim 11 in which the side wall-mould upper surface edges have a radius of 1mm.
- 35
13. A process as claimed in any one of the preceding claims in which bottom corners, formed where the cavity side walls meet the cavity base, are rounded.

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side wall-base bottom corners have a radius of 10mm.

5 15. A process as claimed in claim 13 or claim 14 in which air bores are located in the side wall base bottom corners.

16. A process as claimed in claim 15 in which the air bores have a diameter of 0.1mm to 1mm.

10 17. A process as claimed in claim 16 in which the air bores have a diameter of 0.4mm to 0.5mm.

15 18. A process as claimed in any one of the preceding claims in which the shortest dimension of the planar surface between two adjacent cavities lies in the range of 4mm to 10mm and between an edge of the mould and the closest cavity lies in the range of 2mm to 5mm.

20 19. A process as claimed in any one of the preceding claims in which a continuous strip of uninterrupted planar surface is provided between adjacent rows of cavities.

25 20. A process as claimed in any one of the preceding claims in which a continuous strip of uninterrupted planar surface is provided between every other pair of adjacent rows of cavities.

30 21. A mould for use in a thermoforming process for manufacturing water-soluble containers from water-soluble films, in which said mould contains a plurality of pocket forming cavities, defined by side walls and a base, in a 2-dimensional array, each cavity being surrounded by a planar surface of the mould on all sides in which the  
35 shortest dimension of the planar surface between two adjacent cavities is at least 3mm and between an edge of the mould and the closest cavity is at least 1.5mm, and in which the cavities are positioned in the array such

uninterrupted planar surface of the mould from a leading to a trailing edge of the mould.

22. A mould as claimed in claim 21 in which the depth  
5 of the cavities lies in the range of 10 to 80% of the shortest dimension of the cavity mouth.

23. A mould as claimed in claim 21 or 22 in which the  
10 depth of the cavities lies in the range of 40 to 60% of the shortest dimension of the cavity mouth.

24. A mould as claimed in any one of claims 21 to 23 in which the cavity bases are planar.

15 25. A mould as claimed in any one of claims 21 to 24 in which the cavity bases are rounded.

26. A mould as claimed in claim 25 in which the rounded  
20 bases have a radius of 20mm.

27. A mould as claimed in any one of claims 21 to 26 in which corners formed where the cavity side walls meet each other are rounded.

25 28. A mould as claimed in claim 27 in which the side wall corners have a radius of 10mm.

29. A mould as claimed in any one of claims 21 to 28 in which edges formed where the cavity side walls meet an  
30 upper surface of the mould are rounded.

30. A mould as claimed in claim 29 in which the side wall-mould upper surface edges have a radius of 1mm.

35 31. A mould as claimed in any one of claims 21 to 30 in which bottom corners, formed where the cavity side walls meet the cavity base, are rounded.

32. A mould as claimed in claim 31 in which the side

wall-base bottom corners have a radius of 10mm.

5 33. A mould as claimed in claim 31 or claim 32 in which air bores are located in the side walls base bottom corners.

10 34. A mould as claimed in claim 33 in which the air bores have a diameter of 0.1mm to 1mm.

35. A mould as claimed in claim 34 in which the air bores have a diameter of 0.4mm to 0.5mm.

15 36. A mould as claimed in any one of claims 21 to 35 in which the shortest dimension of the planar surface between two adjacent cavities lies in the range of 4mm to 10mm and between an edge of the mould and the closest cavity lies in the range of 2mm to 5mm.

20 37. A mould as claimed in any one of claims 21 to 36 in which a continuous strip of uninterrupted planar surface is provided between adjacent rows of cavities.

25 38. A mould as claimed in any one of claims 21 to 37 in which a continuous strip of uninterrupted planar surface is provided between every other pair of adjacent rows of cavities.

30 39. A mould as claimed in any one of claims 21 to 38 in which air bores are located.

40. A container formed by the process of any one of the preceding claims.

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Fig.1.

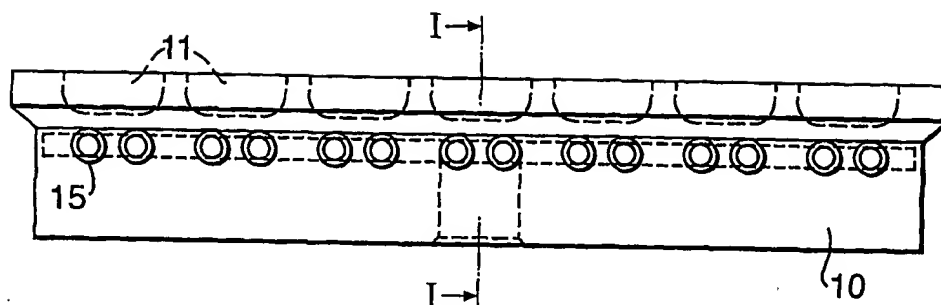
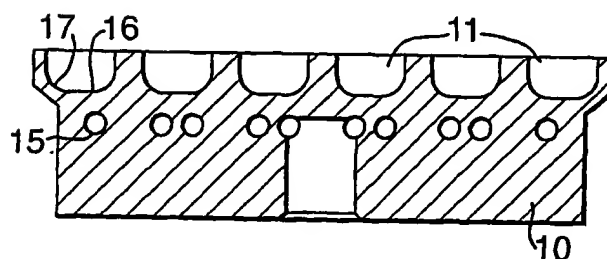


Fig.2.



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Fig.3.

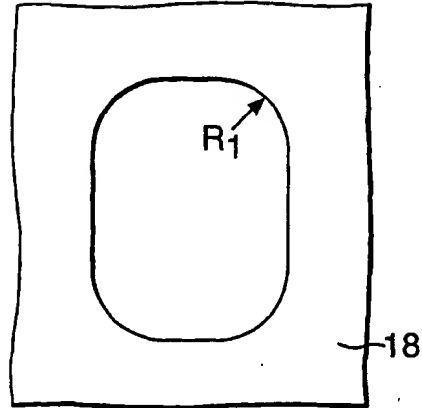


Fig.4.

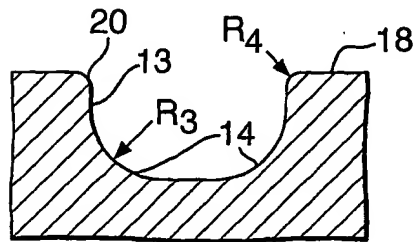


Fig.5.

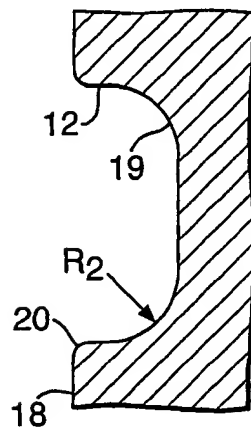




Fig.6.

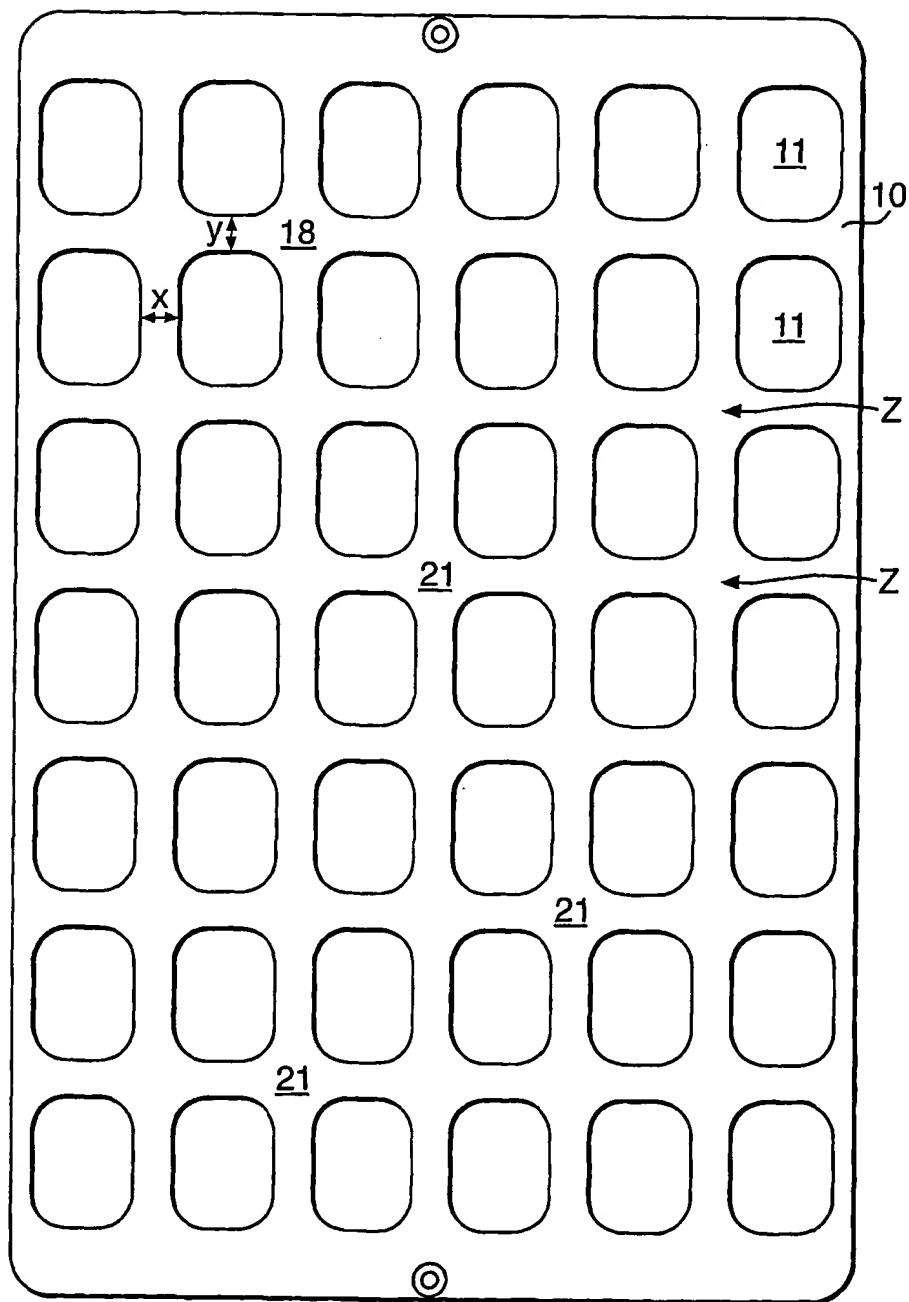


Fig.7.

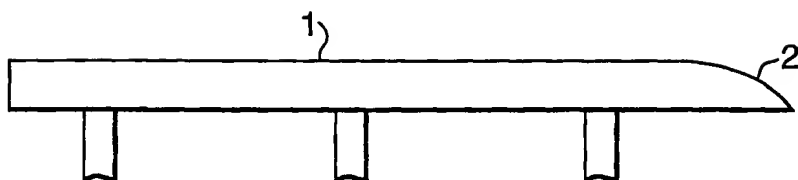


Fig.8.

